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HOME GARDENING IN THE SOUTH

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A WELL-KEPT vegetable garden is a source not only of profit to the gardener but of pleasure to the entire family. For many vegetables which deteriorate rapidly in quality after being gathered, the only practicable means of securing the best is to grow them at home. This is especially true of garden peas, sweet corn, string beans, green Lima beans, and asparagus.

The land utilized for the farm garden, if well cared for, yields much larger returns than any area of similar size planted to the usual farm crops. A half-acre garden should produce as much in money value as 2 or 3 acres in general farm crops.

In most sections of the South, though vegetables can be grown in nearly every month of the year, the garden is neglected; in fact, no feature of southern agriculture is more neglected than the production of vegetables for home use.

In the following pages specific instructions are given for making a garden and caring for it throughout the season.

HOME GARDENING IN THE SOUTH.

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IMPORTANCE OF THE HOME GARDEN.

IN REGIONS where cotton is the principal crop a well-kept garden is the exception, and even in localities where commercial vegetable production is the main industry there is a scarcity of fresh vegetables during a large part of the year. Growing one crop to the exclusion of all others tends to impoverish a community, because it necessitates sending money out of the community for many of the necessities of life which can and should be produced at home. The farmer who buys vegetables is not only paying the cost of production but is also paying the cost of transportation and marketing. Even if vegetables sometimes can be bought more cheaply than they can be produced by the farmer, yet it is desirable to have a home garden. It is not always possible to buy vegetables in country communities, and those that can be secured are usually stale and inferior in quality to the home-grown product.

Fresh vegetables in many cases make up a very small part of the diet of the southern farmer's family. It is impossible to make an accurate estimate of the value of the vegetables which may be grown in home gardens in the South, but a well-kept garden will yield a return several times as great as the return from an equal area devoted to cotton or other general farm crops. Of even greater importance than the money value of the products of the garden is the satisfaction of having a bountiful supply of vegetables close at hand, where they can be secured at a moment's notice.

Vegetables and fruits furnish a large part of the essential salts which are absolutely necessary to the well being of the human system,

so that the value of vegetables in the diet is a great deal more than the mere food or money value. The need of tonics and other medicines in the spring is due largely to the lack of vegetables and fruit in the winter diet. If more succulent food were available, less money would be spent in doctor's fees and for medicines.

Fresh vegetables from the home garden have not been subjected to exposure on the market and are not liable to infection. Many vegetables lose their characteristic flavor within a few hours after gathering. The home vegetable garden is worthy of greatly increased attention by the southern farmer, and a larger number and greater variety of crops should be grown in the garden.

This bulletin gives suggestions as to the location, plan, and arrangement of a home garden, the soil and its preparation, manures and fertilizers, and the seeds and plants to use, together with brief descriptions of the specific methods of handling the more important vegetables and recommendations as to the varieties to plant in order to secure a varied and continuous supply throughout the year.

LOCATION OF THE GARDEN.

As the work of caring for the garden is usually done in spare time it should be located as near the house as possible. A slope to the south or southeast is usually preferable, because here the soil warms up early in the spring, which permits early planting and stimulates the early growth of crops. Practically any type of soil can be used for the garden, but a sandy loam is to be preferred.

Good drainage is of prime importance. The land should have sufficient fall to drain off surplus water during heavy rains, but the fall should not be so great as to wash the soil. If the land near the house is level, artificial drainage should be employed. Open ditches or tile drains will be satisfactory. On level land that is not artificially drained it is necessary to plant on ridges or in beds in order to prevent drowning the crops during wet weather. The ridges or beds should be as wide and flat as conditions will allow, for narrow, sharp ridges dry out quickly.

PLAN AND ARRANGEMENT OF THE GARDEN.

It would be impossible to give a specific scheme of arrangement for a garden that would suit all conditions, and the plans here presented are only suggestive. Each grower should devise a plan to suit his own conditions, but it is hoped that the suggestions given in figures 1 and 2 will be helpful. The gardener should study the area to be used for the garden and then lay it out on paper, as this will save time in planting.

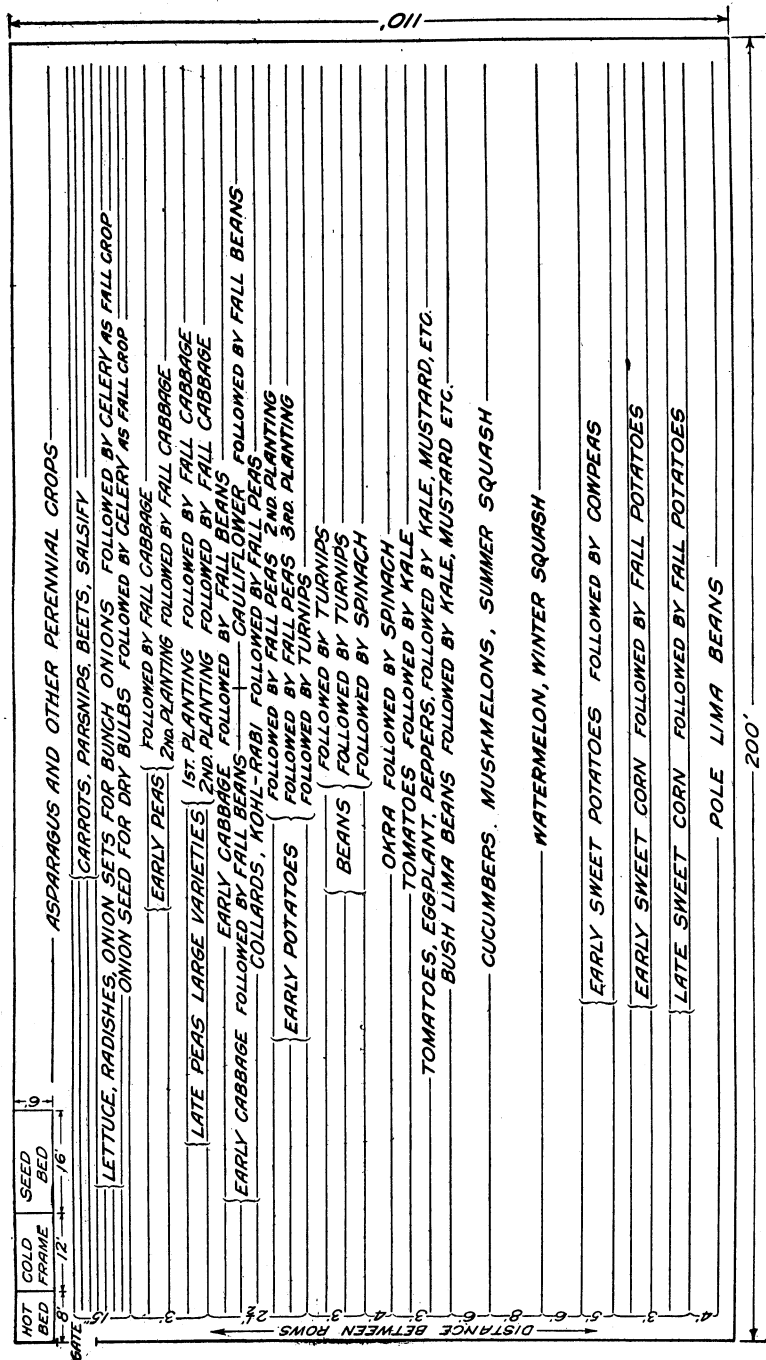


FIG. 1.—Plan of a half-acre garden, showing the location and succession of crops.

By following a plan the gardener will be better able to utilize his land. In most sections of the South it is possible to grow two or

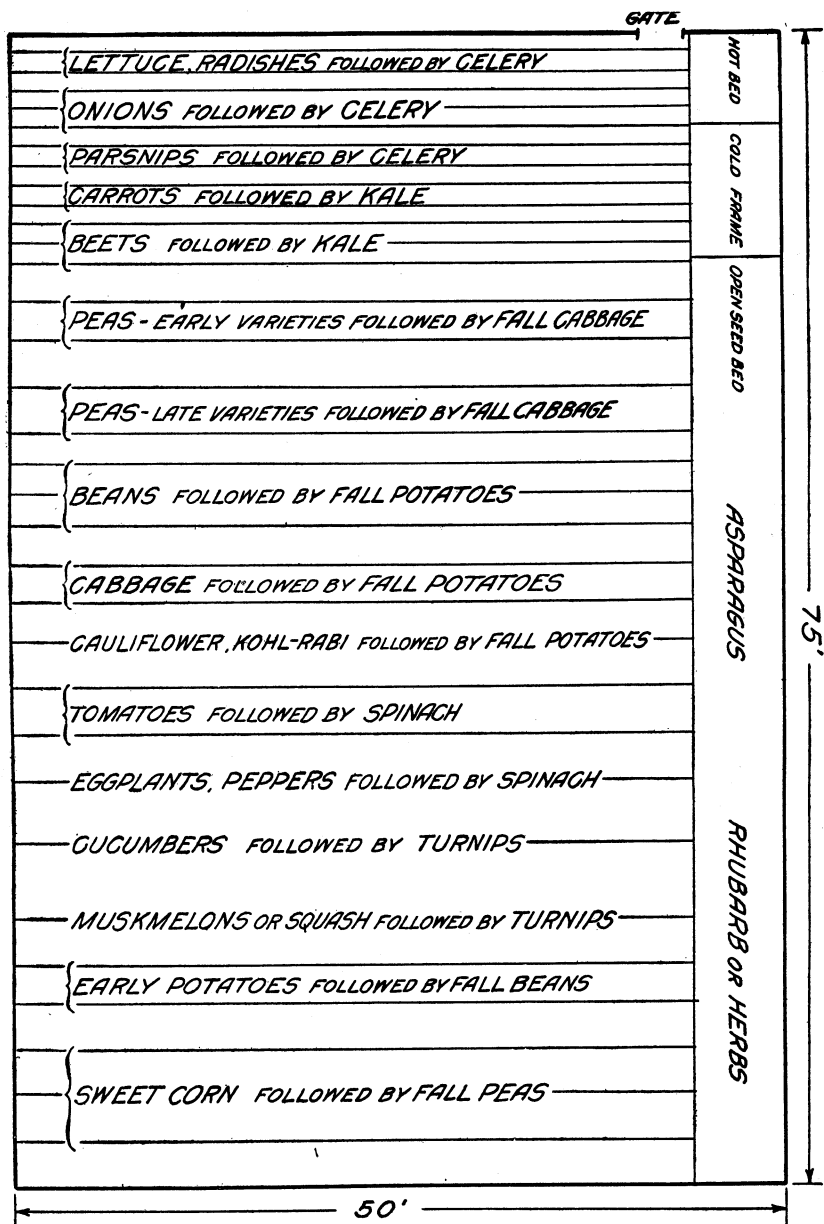


FIG. 2.—Plan of a small garden to be cultivated by hand.

three crops on the same land in one season, and it is better to do this rather than to grow only one crop, even if land is plentiful.

In planning a garden the kind of cultivation to be used should be considered. Horse cultivation is recommended whenever possible, because it saves handwork and is cheaper. Where the work is to be done mainly by means of horse tools, the garden should be long and narrow, with the rows running the long way. The garden should have no paths across the rows, but sufficient turning spaces should be left at the ends. For hand cultivation, the rows can be much closer together and may run across the garden. In the plans shown as figures 1 and 2, where the distance between the rows is less than 2 feet hand cultivation with a wheel hoe is contemplated. If a hand cultivator or wheel hoe is not available, the rows should be at least 2 feet apart to give sufficient space for the horse cultivator. Straight lines should be followed, no matter what method of cultivation is used.

The size of the garden depends upon the number of persons to be supplied. One-fourth to one-half an acre is sufficient for an average family and should produce enough vegetables for use throughout the year. By close attention to the rotation of crops, the succession of crops, and interplanting, one-fourth of an acre may be made to supply a family of six. Where land is available, it is recommended that a sufficient area be set aside to allow part of the garden to be planted to a soil-improving crop each year.

Just what vegetables are to be grown depends, of course, on the individual tastes of the family. It would be a waste of time and space to grow crops not desired by the family. In general, the aim should be to grow those vegetables in which freshness is an important consideration. Beans, peas, Lima beans, sweet corn, and asparagus, for example, lose much if they are not cooked almost immediately after they are gathered. Potatoes, on the other hand, do not deteriorate rapidly, and as good ones can be bought as can be grown in the home garden. Moreover, potatoes occupy a large area in proportion to their yield and should not be grown in a small garden where the area is not sufficient to produce all the vegetables needed by the family. This is also true of sweet corn, peas, cucumbers, and melons. In other words, where the space is limited, those crops should be raised which produce large quantities on small areas or which mature in a short time. Before making a plan of a garden, all of these matters should be considered.

The diagram of a garden should show the location of perennial crops, such as asparagus, rhubarb, and small fruits. These should be placed on one side or at one end of the area, so they will not be in the way when plowing and cultivating the garden. A garden diagram can be used as a record, showing the dates of planting and harvesting the various crops and also the area devoted to each vegetable. By keeping such a record mistakes made one year can be cor-

rected the next. For example, if too much or too little of any vegetable was grown, reference to the diagram will show the extent of the space devoted to the crop and suggest the way to increase or reduce it. A diagram is valuable for the experienced gardener, but is most important for the beginner in gardening.

IMPORTANCE OF SUNLIGHT.

In making his plan the gardener should recognize that no amount of fertilizer, watering, and cultivation will make up for the absence of sunlight in a garden. Careful consideration should be given to how many hours a day any part of the yard is in the shadow of buildings, fences, or trees. If a successful garden is to be maintained, the greater portion of the plat must have at least five hours of sunlight a day. As a rule, foliage crops, such as lettuce, spinach, and kale, do fairly well in partial shade; but even these need sunshine for two or three hours a day. Plants which must ripen fruits, such as the tomato and eggplant, should have the sunniest locations.

SUCCESSION AND ROTATION OF CROPS.

In planning the location of crops consideration should be given to their succession and rotation in order to utilize the land to the best advantage and to check the ravages of diseases and insects. By a succession of crops is meant following one crop with another in the same season, while rotation means changing the crop on a given piece of land from season to season. In planning a succession attention should be given to utilizing the land all the time. As soon as one vegetable is mature another one should be planted in the same space. For example, early beans may be followed by cabbage; tomatoes by spinach, mustard, or turnips; early cabbage by fall potatoes or fall beans. When a crop is harvested early in the season and it is not practicable to plant another vegetable, the land should be planted to cowpeas or crimson clover, to be turned under to improve the soil.

Rotation of crops is as important in growing vegetables as in growing field crops, and the same principles can be applied. Crop rotation is important in checking diseases and insects and in keeping the soil in good condition. Where diseases are very severe, the same crop should not be planted continuously on the same area. Rotation of crops is one of the safeguards against soil infection.

Land upon which a diseased crop has been grown should not be used for the same or a closely related crop oftener than once in three years. It is usually advisable to rotate crops in such a way that foliage crops (such as cabbage, kale, spinach, and mustard) follow root crops (Irish potatoes, beets, parsnips, carrots, etc.) or those

grown for fruits (tomatoes, peppers, melons, etc.). This can be accomplished in a measure by changing the location of crops in the planting plan or by reversing the plan from year to year.

AIDS TO EARLINESS.

In most sections of the South it is desirable to start plants of certain crops before it is safe to plant them out of doors. This can be done by planting seed in a box in the house or in a hotbed, or even in a coldframe.

THE SEED BOX.

The flat, or seed box (fig. 3), which is kept in the house, is perhaps the most practical device for use by the home gardener in starting early vegetables. By its use earlier crops of tomatoes, cabbage, cauliflower, Brussels sprouts, peppers, egg-plant, and lettuce can be had with little outlay for equipment. Early potatoes sometimes are forced in the same way. Seeds so planted germinate and are ready for transplanting by the time it is safe to sow the same kind of seed in the open ground. When danger of frost is over and the soil is dry enough to work, the early garden may be started with seedlings well above the surface.

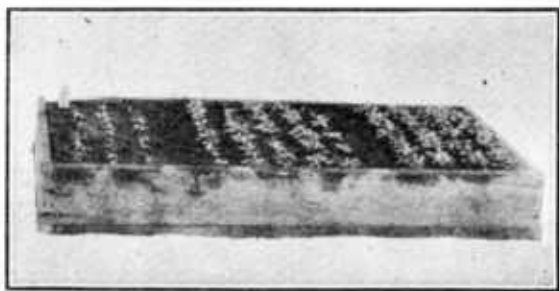


FIG. 3.—A flat, or seed box, used for starting plants in the house.

Any sort of wooden box filled with good soil answers the purpose, but the following specific suggestions for a flat of convenient size may be useful: Construct a box 3 to 4 inches deep, 12 to 14 inches wide, and 20 to 24 inches long. A layer of about 1 inch of gravel or cinders should be placed in the bottom, and it should then be filled nearly full with rich garden soil or soil enriched with decayed leaves or manure. The rich soil beneath the family woodpile or around decaying logs is excellent for this purpose. The soil should be pressed down firmly with a small piece of board and rows made one-fourth to one-half inch deep and 2 inches apart crosswise of the box. The seed should be sown thinly in rows and be covered. The soil should be watered and the box set in a warm place in the light. The best location is just inside a sunny window. Water enough must be given from time to time to cause the seeds to germinate and grow

thriftily, but not enough to leak through the box. If a piece of glass is used to cover the box, it will retain the moisture in the soil and hasten the germination of the seeds. After the plants appear the box should be turned each day to prevent the plants drawing toward the light.

When the plants are from an inch to an inch and a half high they should be thinned to 1 or 2 inches apart in the row, so as to give them space enough to make a strong, stocky growth. If it is desired to keep the plants which are thinned out, they may be set 2 inches apart each way in boxes similar to the seed box. When the weather becomes mild the box of plants should be set out of doors part of the time, so that the plants will "harden off," in preparation for transplanting to the garden later. A good watering should be given just before the plants are taken out of the box for transplanting, so that

a large ball of earth will stick to the roots of each one.



FIG. 4.—Hotbed used for starting plants early in the season in the upper South. Note the method of ventilation.

THE HOTBED.

A more satisfactory method of starting plants is by means of hotbeds or coldframes. A hotbed 6 feet by 6 feet in size will be large

enough for the average garden and can be constructed rather cheaply. In the colder regions of the South some form of heat should be supplied. Fresh manure from the horse stable will be found satisfactory for this purpose. Turn the manure two or three times before placing it in the bed, in order to make it uniform in composition and mechanical condition. Make the excavation for the bed about 18 inches deep and put in 15 to 18 inches of fresh manure, packing it well by trampling. Arrange a frame, similar to the one shown in figure 4, over the manure, so the slope will be to the south. Place 4 or 5 inches of good garden loam over the manure and cover the frame with hotbed sash or a heavy canvas, preferably the former. The manure will heat quite rapidly for the first few days. During that time ventilate the bed frequently, to allow the gases to escape and to lower the temperature. The seeds should not be planted until the temperature goes down to 80° or 85° F. After the seeds have been planted, close attention should be given to the watering and

ventilation of the bed. The soil should never be allowed to dry out, but it should not be kept water-soaked. Moisture is necessary for the germination of the seed and the growth of the plants, but an excess of moisture should be avoided, as it stimulates the development of diseases, especially damping-off. Water should be applied early enough in the day to allow the plants to dry before night. Ventilate the beds during the heated portion of the day, but cover them in time to insure their warming up enough to prevent the chilling of the plants during the night.



FIG. 5.—A large coldframe covered with canvas. This type of frame is often used for starting plants as well as for hardening them off.

THE COLDFRAME.

The coldframe (fig. 5), so useful in hardening plants started in the hotbed and for starting plants in mild climates, is constructed in much the same way as the hotbed, except that no manure is used and the frame may be covered either with glass sash or canvas. A coldframe may be built on the surface of the ground, but a more permanent structure suitable for holding plants over winter will require a pit 18 to 24 inches deep. The coldframe should be filled with a good potting soil. Plants should have more ventilation in a coldframe than in a hotbed, but should not receive so much water. It is best to keep the soil rather dry.

TRANSPLANTING.

In transplanting, remember that plants usually thrive better if put into ground that has been freshly cultivated. Transplanting to the open field is best done in cool, cloudy weather and in the afternoon. This prevents the sun's rays from causing the plants to lose too much moisture through evaporation.

For the best results, plants started in boxes, hotbeds, or cold-frames should be transplanted when they reach a height of 1 to 2 inches. Transplanting tends to produce uniform, stocky plants, with



FIG. 6.—Celery plants, showing how transplanting stimulates root growth. The two plants on the left were transplanted; those on the right were not transplanted. All of these plants are from the same seedling.

a well-developed root system. The seedlings may be transplanted to boxes or to the hotbed or coldframe, to stand about 2 inches apart each way. Some growers transplant twice before setting in the open ground.

Figure 6 shows four celery plants from the same seedling. The two at the left were transplanted, while those on the right were allowed to remain in the seed bed until time for planting in the garden.

HARDENING OFF.

Plants grown in a house, hotbed, or coldframe should be hardened off before they are transplanted to the garden. This can be accom-

plished by ventilation and exposure to outdoor conditions during the day in good weather. If the plants are in a hotbed or a cold-frame the covers may be removed during the day when the weather is good and replaced toward nightfall. After danger of frosts is past the covers may be left off at night. By the time the plants are large enough to be transplanted to the garden they should be thoroughly accustomed to outdoor conditions. Such plants usually withstand the transfer to the garden with little check and few losses.

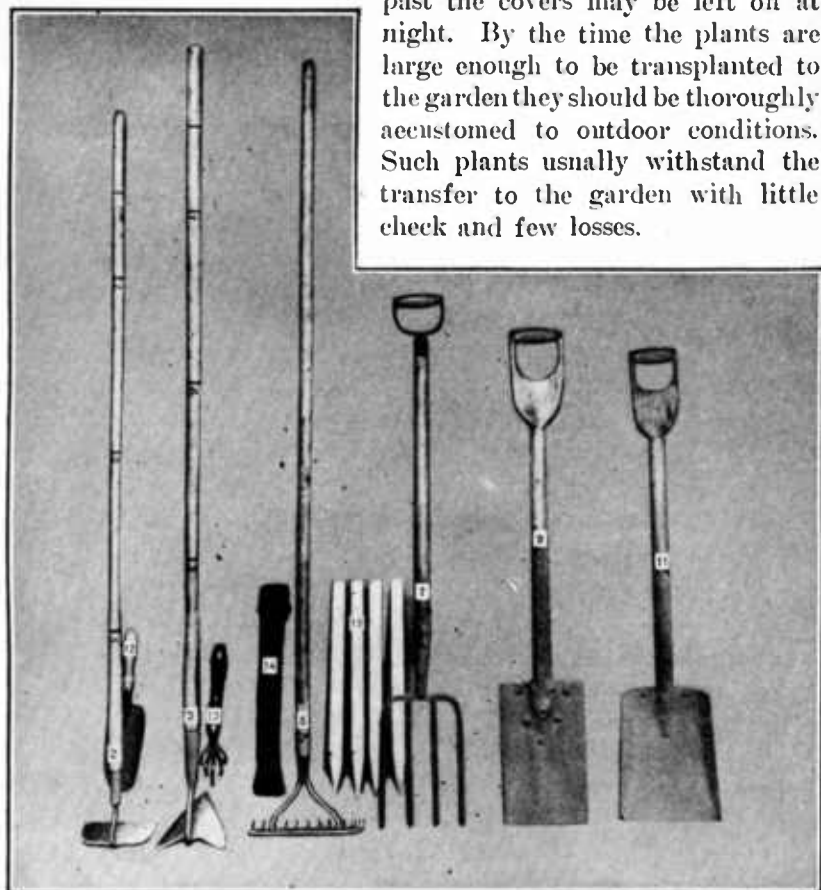


FIG. 7.—A set of useful garden tools: (2) Hoe, (3) heart-shaped furrow hoe, (5) steel-tooth rake, (7) spading fork, (9) spade, (11) shovel, (12) trowel, (13) scratch weeder, (14) garden line, (15) garden stakes or labels. Note that the hoe handles are marked off in feet and half feet for convenience in measuring.

SETTING PLANTS IN THE OPEN.

Before taking the plants from the bed they should be thoroughly watered and the water allowed to soak into the ground. This will insure a portion of the soil adhering to the roots and will prevent serious wilting or the checking of growth. Take up the plants with a trowel or spade, and pack them in boxes or baskets in which to carry them to the field.

The land should be in good condition and everything should be ready for quick operation when planting time arrives. Mark off the rows or dig the holes for the plants just before planting, to prevent the drying of the soil.

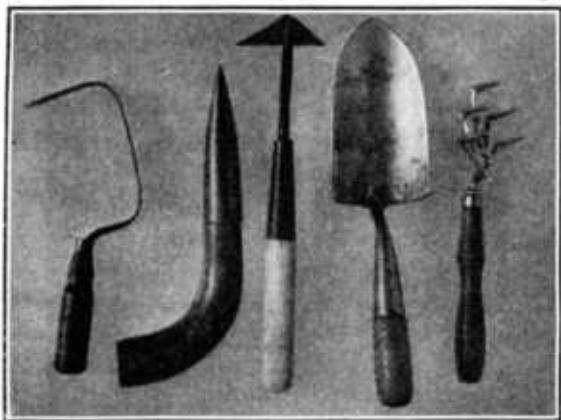


FIG. 8.—Small hand tools for the garden. From left to right they are a hand-scraper weeder, a dibble, onion weeder, trowel, and a scratch or claw weeder.

If possible, set the plants on a cloudy day or just before nightfall. When the soil is very dry it is advisable to use a little water in the hole. The water should be applied when the hole is partially filled with soil, and the moist earth should then be covered with dry soil to prevent baking. Plants should be set a trifle deeper in the

garden than they were in the plant bed. Pack the soil thoroughly around the plants, so as to avoid air spaces.

TOOLS FOR THE GARDEN.

In addition to the plows, harrows, and cultivators usually found on the farm, the gardener will find it convenient to possess additional implements and tools. Every farmer should have a common garden hoe, a steel-tooth rake, a spade, a trowel, and a spading fork. The other accessories shown in figures 7 and 8 will be found valuable but are not absolutely essential. A wheel hoe similar to the one shown in figure 9 is a desirable implement for any garden, as its use reduces the amount of hand hoeing necessary. In a city or town garden all the work is usually done with a wheel hoe and the hand tools shown in figures 7 and 8. The small hand weeders are especially useful in caring for the plants in

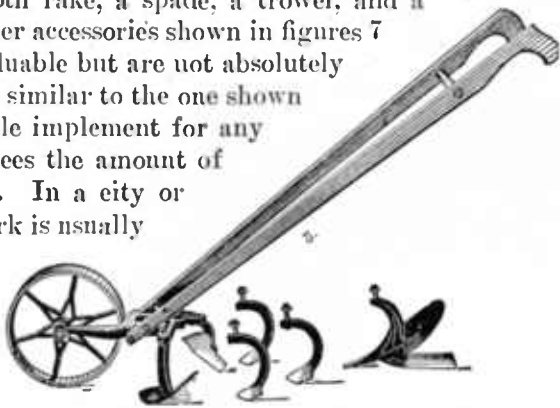


FIG. 9.—A wheel hoe, useful in any garden.

hotbeds and coldframes, with a trowel is useful in taking up plants from the plant bed and setting them in the garden. The garden line is used in laying out the garden and in making the rows straight.

In addition to the tools and implements already mentioned, a wheelbarrow, a claw hoe, and a watering can will be found useful in gardening.

SEEDS FOR THE GARDEN.

The seeds for the garden should be at hand considerably in advance of the planting season. Secure catalogues from reliable seedsmen, and after making a plan of the garden select the varieties and quantities of each kind of seed needed.

The following are the approximate quantities of seed that should be purchased for a garden which is to supply vegetables for a family of four.

Seeds for a vegetable garden to supply a family of four.

Bean :		Melon—Continued.
Bush Lima.....	1 pint.	Watermelon 2 ounces.
Pole Lima.....	1 pint.	Onion sets 4 to 6 quarts.
Snap.....	1 to 2 quarts.	Pea, garden..... 4 to 6 quarts.
Beet	4 ounces.	Parsley 1 packet.
Cabbage :		Parsnip One-half ounce.
Early	1 packet.	Radish 1 ounce.
Late	One-half ounce.	Salsify 1 ounce.
Carrot	1 ounce.	Spinach :
Cauliflower	1 packet.	In spring..... One-quarter pound.
Celery	1 packet.	In fall..... One-half pound.
Corn, sweet.....	1 to 2 pints.	Squash :
Cucumber	1 ounce.	Hubbard 1 ounce.
Eggplant	1 packet.	Summer 1 ounce.
Kale	2 ounces.	Tomato :
Lettuce	One-half ounce.	Early 1 packet.
Melon :		Late One-quarter ounce.
Muskmelon	1 ounce.	Turnip..... 2 to 3 ounces.

The quantities of seed specified should produce sufficient vegetables to supply the needs of the family during the growing season, as well as to supply a surplus for canning, drying, and storing.

It is not supposed that any family will desire to grow all of the vegetables listed, nor will all families require the same amount of any crop, but the estimates given will be a guide. For ordinary requirements the entire supply of seeds of snap beans, peas, beets, sweet corn, lettuce, radishes, and beets should not be planted at one time, but successive plantings should be made at intervals of two to four weeks, so that a fresh supply of vegetables may be had throughout the season.

PREPARATION OF THE SOIL.

If the land to be used for the garden has not been under cultivation, it should be cleared of all trees, underbrush, stumps, stones, and trash of all kinds. Where the soil has been used for gardening, all

rubbish, including the remains of previous crops, should be removed and composted or burned. If disease has been serious during the preceding year, it is safer to burn the plant remains rather than to compost, though the composted material, even if diseased, might be applied to other portions of the farm where vegetables are not grown, without much chance of injuring the crops.

The soil that is to be used for vegetables should be thoroughly prepared before planting. A deep seed bed is desirable, and when an area that has never been plowed more than 4 inches deep must be used it should be deepened by gradually increasing the depth of plowing for a period of three or four years until the desired depth is attained.

Clay soil should be plowed in the fall if there is no danger of washing, so as to get it in a good mechanical condition before planting time. In the cooler regions of the South freezing will pulverize the soil, while in regions where freezes do not occur the pulverizing must be done by harrowing and cultivation. Sandy loams or soils that contain a large amount of humus should be plowed far enough in advance to allow the soil to settle before planting.

Thorough preparation by plowing, harrowing, and rolling or dragging will lessen the work of cultivation. It is not sufficient to smooth and level the surface; the pulverizing should extend down several inches.

Small gardens in cities and towns are usually prepared by hand rather than with horse-drawn implements. The work of breaking the soil is usually done with a spade, spading fork, or mattock. As the soil is turned up with the spade or fork it should be broken up by hitting it with the back of the tool used. Before the surface has a chance to bake it should be well pulverized with a rake.

IMPROVING THE TEXTURE OF THE SOIL.

It is desirable that the soil of the garden be as open and light as possible. Where a natural loam exists in the plat good texture can be obtained by digging and cultivating. Where the soil is heavy, containing much clay, however, other steps are necessary. If clean sand is available this may be mixed with the soil. Well-sifted coal ashes, which, unlike wood ashes, have no fertilizing value, are useful in lightening the soil. Care should be taken that no coarse cinders or pieces of partly burned coal are added to the soil with the ashes.

MANURES AND FERTILIZERS.

The soil for vegetable growing should be rich and well supplied with humus. Barnyard or stable manure is the best fertilizer, because it furnishes both plant food and humus. An application of

20 to 30 tons of manure to the acre is very satisfactory, and on some soils this application will need but little reinforcing with commercial fertilizers. The manure should be applied far enough in advance of planting time to allow it to decay. When coarse manure is used it should be applied in the fall and turned under, but well-rotted manure should be applied after plowing and should be well mixed with the soil by harrowing. On many soils it is advisable to apply commercial fertilizer, especially phosphates, in addition to the manure. An application of 300 to 600 pounds of acid phosphate to the acre will be sufficient. Sandy soils often need a little additional potash, which, under normal conditions, can be applied in the form of muriate or sulphate of potash at the rate of 200 to 400 pounds to the acre. An application of 100 pounds of nitrate of soda will give the plants a start in the spring before the nitrogen in the manure has become available.

Where manure is not available, some leguminous crop, such as cowpeas, soy beans, vetch, or crimson clover, should be turned under to supply humus and a part of the nitrogen. Additional fertilizing elements can be applied in the form of commercial fertilizers. No definite rule can be given for the kind or quantity of fertilizer to be applied, as this varies with the crop and soil. In most cases it is safe to apply 1,000 to 2,000 pounds of a high-grade fertilizer to the acre. One analyzing 2 to 4 per cent nitrogen, 8 per cent phosphoric acid, and 6 to 8 per cent potash should give good results if the soil is well supplied with humus. This fertilizer may be secured already prepared or may be mixed at home. The following combination will make a satisfactory fertilizer for a home garden and may be applied at the rate of 1,000 to 2,000 pounds to the acre. The quantities given are sufficient for an acre. They should be reduced proportionately for smaller gardens.

150 pounds of nitrate of soda.

650 pounds of cottonseed meal.

1,000 pounds of acid phosphate, 16 per cent.

200 pounds of muriate or sulphate of potash.

Under present conditions (January, 1918) potash is so scarce and expensive that most commercial brands of fertilizer contain no potash or only 1 to 2 per cent of this element; on most farms, however, wood ashes can be used to supply the needed potash for garden crops. Unleached wood ashes might be applied at the rate of 1,000 to 1,500 pounds per acre.

It should be borne in mind that commercial fertilizers will not produce satisfactory results unless the soil is well supplied with humus. In fact, large quantities of fertilizers are justified only where the

soil is in good mechanical condition. Many soils in the South that have been in cultivation for a long time are in a poor mechanical condition and need humus, which can be supplied by turning under green crops or coarse manure.

PLANTING VEGETABLE SEEDS IN THE OPEN.

TIME FOR PLANTING EARLY CROPS.

No definite rule can be given as to the exact time that vegetable seeds can be safely planted in all sections, but the dates given in Tables I and II are approximately correct and may be followed

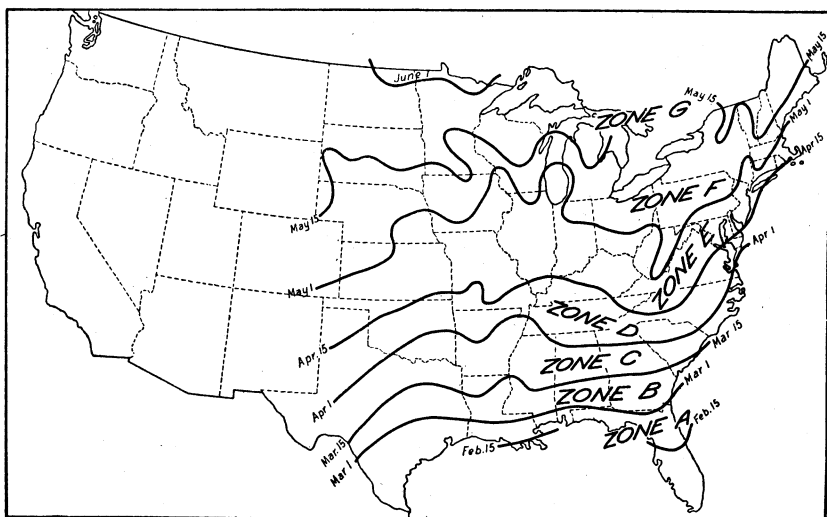


FIG. 10.—Outline map of the United States, showing zones based on the average date of the last killing frost in spring. The time of planting of the various vegetables in the different zones is determined by the dates given on this map.

with a reasonable degree of safety. The time given is based on the average date of the last killing frost in spring for the earliest planting and on the average date of the first killing frost in autumn for the latest planting. By reference to the maps shown in figures 10 and 11 one can readily determine the zone in which he is located. It should be remembered that there is a difference of about two weeks between zones in the dates for planting. It should also be borne in mind that the time recommended is based on the *average* dates of killing frosts. Some years a killing frost occurs later than the average in the spring and earlier than the average in the fall; however, it is advisable to take some chances on planting, in order to get crops as early as possible in spring and as late as possible in autumn.

In southern Florida below zone A, most vegetables are started in late summer and in autumn for winter and spring use. Some of the hardy crops can withstand the winter weather if they get a good growth in the autumn in zones B, C, and D. Cabbage, collards, turnips, spinach, and kale, for example, will withstand the winter even as far north as the upper part of zone D. Spinach, with a little covering of leaves, straw, or other litter, will sometimes go through the winter in zone E. Cabbage is planted in December in the vicinity of Charleston, S. C., but the plants used are well hardened by growing in the open. In most sections of zone B it is safer to plant cabbage from January 15 to February 15, especially if frame-grown plants

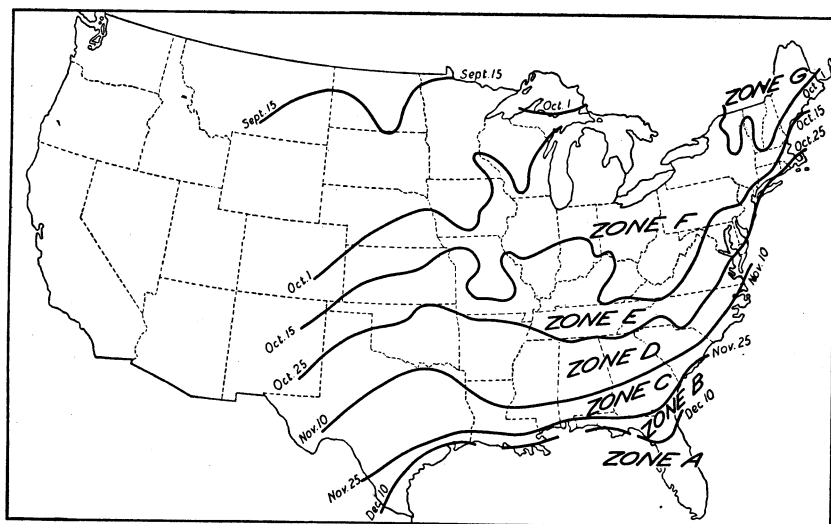


FIG. 11.—Outline map of the United States, showing zones based on the average date of the first killing frost in autumn. The latest safe dates of planting vegetables in the autumn are determined by the dates given on this map.

are used. Very little time is saved by planting cabbage earlier than the dates given in the table, as those plants which pass through freezing weather are severely checked and stunted and, in addition, are more likely to go to seed than those which have not been checked.

It should be borne in mind that the dates given in the table refer to the first planting. Several plantings should be made of crops which mature in a short time or which are in their prime only a short while. This is especially true of string beans, lettuce, radishes, peas, and sweet corn. Plantings of these should be made at intervals of two or three weeks until the weather gets too hot for their development.

TABLE I.—*Earliest safe dates for planting in the open in the zones of the United States illustrated in figure 10.*

Crop.	Zone A.	Zone B.	Zone C.	Zone D.	Zone E.
Asparagus.....	(Not grown)....	Feb. 15 to Mar. 1	Mar. 1 to 15....	Mar. 15 to Apr. 15.	Apr. 15 to May 1.
Artichoke:					
Globe.....	Mar. 1 to 15....	Mar. 15 to Apr. 1	Apr. 1 to 15....	Apr. 15 to May 15.	May 1 to 30.
Jerusalem....	Feb. 1 to 15....	Feb. 15 to May 1	Mar. 1 to 15....	Mar. 15 to Apr. 1	Apr. 1 to 15.
Bean:					
Lima.....	Mar. 1 to 15....	Mar. 15 to Apr. 1	Apr. 1 to 15....	May 1 to 15....	May 15 to June 1.
Snap.....	Feb. 15 to Mar. 1	Mar. 1 to 15....	Mar. 15 to 30....	Apr. 1 to May 1	May 1 to 15.
Beet.....	Feb. 1 to 15....	Feb. 15 to Mar. 1	Mar. 1 to 15....	Mar. 15 to Apr. 15	Apr. 15 to May 1.
Brussels sprouts..	do.....	do.....	do.....	do.....	Do.
Cabbage.....	Jan. 1 to Feb. 1.	Jan. 15 to Feb. 15.	Feb. 15 to Mar. 1	Mar. 1 to 15....	Mar. 15 to Apr. 15.
Carrot.....	Feb. 1 to 15....	Feb. 15 to Mar. 1	Mar. 1 to 15....	Mar. 15 to Apr. 15.	Apr. 15 to May 1.
Cauliflower.....	do.....	do.....	do.....	do.....	Do.
Celery.....	do.....	do.....	do.....	do.....	Do.
Chard.....	do.....	do.....	do.....	do.....	Do.
Collard.....	Jan. 1 to Feb. 1.	Feb. 1 to 15....	Feb. 15 to Mar. 1	Mar. 1 to 15....	Mar. 15 to Apr. 15.
Corn, sweet.....	Feb. 15 to Mar. 1	Mar. 1 to 15....	Mar. 15 to Apr. 1	Apr. 1 to May 1	Apr. 15 to May 15.
Cucumber.....	Mar. 1 to 15....	Mar. 15 to Apr. 1	Apr. 1 to 15....	Apr. 15 to May 1	May 1 to June 1.
Eggplant.....	do.....	do.....	do.....	do.....	Do.
Garlic.....	Jan. 1 to Feb. 1.	Feb. 1 to 15....	Feb. 15 to Mar. 1	Mar. 1 to 15....	Mar. 15 to Apr. 15.
Kale.....	do.....	do.....	do.....	do.....	Do.
Kohl-rabi.....	Feb. 1 to 15....	Feb. 15 to Mar. 1	Mar. 1 to 15....	Mar. 15 to Apr. 1	Apr. 1 to May 1.
Lettuce:					
Head.....	do.....	do.....	do.....	Mar. 15 to Apr. 15.	Do.
Leaf.....	Jan. 1 to Feb. 1.	Feb. 1 to 15....	Feb. 15 to Mar. 1	Mar. 1 to 15....	Mar. 15 to Apr. 15.
Melon.....	Mar. 1 to 15....	Mar. 15 to Apr. 1	Apr. 1 to 15....	Apr. 15 to May 1	May 1 to June 1.
Mustard.....	Feb. 1 to 15....	Feb. 15 to Mar. 1	Mar. 1 to 15....	Mar. 15 to Apr. 1	Apr. 1 to May 1.
Okra, or gumbo..	Feb. 15 to Mar. 1	Mar. 15 to Apr. 1	Mar. 15 to 30....	Apr. 15 to May 1	May 1 to 15.
Onion:					
Seed.....	Feb. 1 to 15....	Feb. 15 to Mar. 1	Mar. 1 to 15....	Mar. 15 to Apr. 1	Apr. 1 to May 1.
Sets.....	Jan. 1 to Feb. 1.	Feb. 1 to 15....	Feb. 15 to Mar. 1	Mar. 1 to 15....	Mar. 15 to Apr. 15.
Parsley.....	Feb. 1 to 15....	Feb. 15 to Mar. 1	Mar. 1 to 15....	Mar. 15 to Apr. 1	Apr. 1 to May 1.
Parsnip.....	do.....	do.....	do.....	do.....	Do.
Pea:					
Smooth.....	Jan. 1 to Feb. 1.	Feb. 1 to 15....	Feb. 15 to Mar. 1	Mar. 1 to 15....	Mar. 15 to Apr. 15.
Wrinkled.....	Feb. 1 to 15....	Feb. 15 to Mar. 1	Mar. 1 to 15....	Mar. 15 to Apr. 1	Apr. 1 to May 1.
Peppers.....	Mar. 1 to 15....	Mar. 15 to Apr. 1	Apr. 1 to 15....	Apr. 15 to May 1	May 1 to June 1.
Potatoes:					
Irish.....	Jan. 1 to Feb. 1.	Feb. 1 to 15....	Feb. 15 to Mar. 1	Mar. 1 to 15....	Mar. 15 to Apr. 15.
Sweet.....	Mar. 1 to 15....	Mar. 15 to Apr. 1	Apr. 1 to 15....	Apr. 15 to May 1	May 1 to June 1.
Pumpkins.....	do.....	do.....	do.....	do.....	Do.
Radish.....	Jan. 1 to Feb. 1.	Feb. 1 to 15....	Feb. 15 to Mar. 1	Mar. 1 to 15....	Mar. 15 to Apr. 15.
Rhubarb.....	(Not grown)....	(Not grown)....	Mar. 1 to 15....	Mar. 15 to Apr. 15.	Apr. 15 to May 1.
Salsify.....	Feb. 1 to 15....	Feb. 15 to Mar. 1	do.....	do.....	Do.
Spinach.....	do.....	do.....	do.....	do.....	Do.
Squash.....	Mar. 1 to 15....	Mar. 15 to Apr. 1	Apr. 1 to 15....	Apr. 15 to May 1	May 1 to June 1.
Tomato.....	do.....	do.....	do.....	do.....	Do.
Turnip.....	Jan. 1 to Feb. 1.	Feb. 1 to 15....	Feb. 15 to Mar. 1	Mar. 1 to 15....	Mar. 15 to Apr. 15.

TIME OF PLANTING FOR THE FALL GARDEN.

In all sections of the South it is possible to have a good fall garden by starting the crops during late summer and early autumn. In zone A (fig. 11) most of the vegetables grown for fall and winter use are planted in late summer or early autumn.

In this region and in zone B most garden crops should be planted as soon as the hot weather will permit. It is difficult to get crops

started during the hottest weather in zones B and C, but there is sufficient time to produce most of the common vegetables in the autumn by planting after the weather gets cool enough for the seeds to germinate and the plants to grow. In zone D practically all vegetables can be grown in the fall garden by starting the crops in late summer and early autumn, the time of planting depending on the length of time required for the crop to mature.

In zone E most crops must be started in summer in order to mature before frost, but short-season crops or hardy crops, such as lettuces, radishes, spinach, kale, mustard, and turnips, may be planted in August and September.

Table II shows the latest safe dates of planting for the vegetables that are commonly grown in the fall garden. Dates are not given for many crops in zone B because most long-season crops can not be planted early enough to produce a crop during the autumn, and short-season, hardy crops can be grown practically throughout the autumn and winter.

TABLE II.—*Latest safe dates for planting vegetables for the fall garden in the zones of the United States illustrated in figure 11.*

Crop.	Zone B.	Zone C.	Zone D.	Zone E.
Bean, snap.....	Oct. 1 to 15.....	Sept. 15 to 30.....	Aug. 15 to 30.....	Aug. 1 to 30.
Beet.....	do.....	do.....	Aug. 1 to 30.....	July 15 to Aug. 15.
Cabbage.....	do.....	Sept. 1 to 15.....	Aug. 15 to Sept. 1.	Do.
Carrot.....	do.....	do.....	do.....	Do.
Cauliflower.....	do.....	do.....	Aug. 1 to Sept. 1.	July 1 to Aug. 1.
Celery.....	do.....	Oct. 1 to 15.....	Sept. 1 to 30.....	Do.
Corn, sweet.....	do.....	Aug. 15 to 30.....	Aug. 1 to 15.....	July 15 to Aug. 15.
Cucumber.....	do.....	do.....	do.....	do.....
Kale.....	do.....	Oct. 15 to Nov. 15.	Oct. 1 to 30.....	Sept. 1 to 30.
Lettuce.....	do.....	do.....	Oct. 1 to 15.....	Do.
Mustard.....	do.....	do.....	do.....	Do.
Parsley.....	do.....	do.....	do.....	Do.
Pea.....	do.....	do.....	do.....	Aug. 15 to Sept. 15.
Potato:				
Irish.....	do.....	Aug. 15 to 30.....	Aug. 1 to 15.....	July 1 to 30.
Sweet.....	Aug. 15.....	Aug. 1 to 15.....	July 15 to 30.....	June 1 to 30.
Radish.....	do.....	Oct. 15 to 30.....	Oct. 1 to 15.....	Aug. 15 to Sept. 30.
Spinach.....	do.....	do.....	do.....	Do.
Tomato.....	do.....	Aug. 15 to 30.....	July 15 to Aug. 15.	July 1 to 30.
Turnip.....	do.....	Oct. 15 to 30.....	Oct. 1 to 15.....	Aug. 15 to Sept. 30.

DEPTH OF PLANTING AND DISTANCE APART.

No general rule can be given with regard to the depth of planting that will fit all conditions, as different kinds of vegetables and different soils necessitate different practices. The smaller the seeds, the shallower the covering should be. In heavy clay soils the covering should be lighter than in sandy soils. When the soil is moist and cool, seeds of any given vegetable should be planted shallower than when the soil is dry.

Table III gives the proper depth of planting of the various vegetable seeds, as well as the quantity of seeds or number of plants

required for 100 feet of row and the distance apart of the rows and the plants in the row.

TABLE III.—Quantity of seeds and number of plants required for 100 feet of row, with the proper depths of planting and distances apart for rows and plants.

Kind of vegetable.	Required for 100 feet of row.		Depth for plant- ing seed.	Distance apart.		
	Seed.	Plants.		Rows.		Plants in the row.
				Horse cultiva- tion.	Hand cultiva- tion.	
Asparagus.....	1 ounce.....	60 to 80	<i>Inches.</i> 1 to 1½	<i>Feet.</i> 3 to 4	2 feet.....	15 inches.
Bean:						
Bush Lima.....	½ to 1 pint.....		1½ to 2	3	2½ feet.....	6 to 10 inches.
Pole Lima.....	½ pint.....		1½ to 2	4	3 feet.....	3 to 4 feet.
Snap.....	1 pint.....		1½ to 2	2½ to 3	2 feet.....	3 to 4 inches.
Beet.....	2 ounces.....		1 to 1½	2 to 2½	15 to 18 inches..	4 to 5 inches.
Cabbage.....	½ ounce.....	65 to 90	½	2½ to 3	2 to 2½ feet..	14 to 18 inches.
Carrot.....	1 ounce.....		½	2 to 2½	15 to 18 inches..	3 to 4 inches.
Cauliflower.....	½ ounce.....	60 to 75	½	2½ to 3	2 to 2½ feet..	15 to 18 inches.
Celery.....	do.....	200 to 250	½	3 to 4	18 to 24 inches..	4 to 6 inches.
Collard.....	½ ounce.....	65 to 100	½	2 to 2½	do.....	12 to 18 inches.
Corn, sweet.....	1 pint.....		2	3 to 3½	2½ to 3 feet.....	10 to 12 inches.
Cucumber.....	1 ounce.....		1 to 1½	4 to 5	4 to 5 feet.....	15 inches.
Eggplant.....	1 ounce.....	50 to 70	½	2 to 2½	2 to 2½ feet..	18 to 24 inches
Kale.....	½ ounce.....		½	2½ to 3	18 to 24 inches..	8 to 10 inches.
Lettuce.....	do.....	125 to 200	½	2 to 2½	15 to 18 inches..	6 to 10 inches.
Melon:						
Muskmelon.....	do.....		1 to 1½	5 to 6	5 to 6 feet.....	(Drills 18 inches. Hills 5 feet.
Watermelon....	1 ounce.....		1 to 2	8 to 10	8 to 10 feet.....	(Drills 2 to 3 feet Hills 8 feet.
Okra.....	2 ounces.....		1 to 2	4	3 feet.....	2 feet.
Onion:						
Seed.....	1 ounce.....		½ to 1	2	15 inches.....	3 to 4 inches.
Sets.....	1 quart.....		1 to 2	2	do.....	Do.
Parsley.....	½ ounce.....		½	2	do.....	Do.
Parsnip.....	½ ounce.....		½ to 1	2 to 2½	15 to 18 inches..	Do.
Pea.....	1 to 2 pints.		2 to 3	3 to 4	2½ to 3 feet.....	1 inch.
Potato:						
Irish.....	5 to 6 pounds..		4	2½ to 3	2 to 2½ feet.....	12 to 18 inches.
Sweet.....	3 pounds.....	75 slips.	2 to 3	4 to 5	4 to 5 feet.....	14 to 18 inches
Radish.....	1 ounce.....		½ to 1	2	12 to 15 inches..	1 inch.
Salsify.....	do.....		½ to 1	2	15 to 18 inches..	Do.
Spinach.....	do.....		1 to 2	2	do.....	1 to 2 inches
Squash:						
Bush.....	½ ounce.....		1 to 2	3 to 4	3 to 4 feet.....	(Drills 15 to 18 inches. Hills 4 feet.
Vine.....	do.....		1 to 2	7 to 10	7 to 10 feet.....	(Drills 2 to 3 feet. Hills 8 feet.
Tomato.....	½ ounce.....	35 to 50	½ to 1	3 to 4	2 to 3 feet.....	2 to 3 feet.
Turnip.....	½ ounce.....		½ to ½	2	15 to 18 inches..	2 to 3 inches.

CULTIVATION OF GARDEN CROPS.

Frequent shallow cultivation should be given garden crops. By keeping the surface of the soil stirred a dust mulch is formed, which prevents the loss of moisture through the pores in the soil and keeps down weeds.

The soil should be cultivated as soon as possible after a rain, to break the crust and prevent baking. Sandy soils may be cultivated when quite wet, but clay soils should not be stirred when sticky. Too much emphasis can not be placed on the matter of thorough

cultivation. If the work is properly done at the right time there will be little difficulty in controlling weeds.

In cultivating the garden, small-tooth cultivators should be used to prevent ridging or furrowing. Figure 12 shows a good type of horse cultivator for use in the garden. A turnplow or sweep should not be used for cultivation unless the land becomes so weedy that cultivators will not do the work. Frequent cultivation kills the weeds between the rows before they become large, but handwork will be necessary to keep the soil stirred between the plants and to keep down weeds in the row. A good hand cultivator, similar to the one shown in figure 9, is valuable to the vegetable gardener.

In a small garden, cultivation is done by hand, using a wheel hoe (like that shown in fig. 9), hand hoe, and rake.

The same principles of cultivation apply to the small garden cultivated by hand as apply to large gardens worked by means of horse implements.

IRRIGATION OF GARDEN CROPS.

Throughout those portions of the country where rains occur during the growing season it should not be necessary to irrigate in order to produce the ordinary garden crops. In arid regions, where irrigation must be depended upon for the production of crops, the system best adapted for use in that particular locality should be employed in the garden. Wherever irrigation is practiced the water should not be applied until needed, and then the soil should be thor-

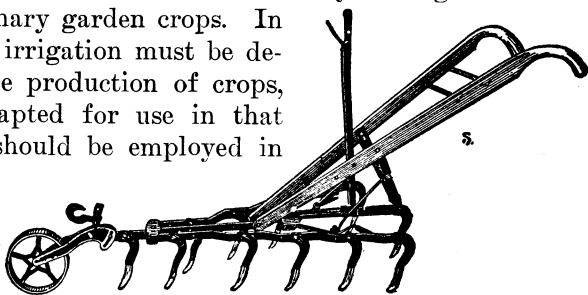


FIG. 12.—A small-tooth horse cultivator, useful in cultivating a small garden.

oughly soaked. After irrigation, the land should be cultivated as soon as the surface becomes sufficiently dry, and no more water should be applied until the plants begin to show the need of additional moisture. Constant or excessive watering is very detrimental in every case. Apply the water at any time of the day that is most convenient and when the plants require it.

By the subirrigation method of watering, lines of farm draitiles or perforated pipes are laid on a level a few inches below the surface of the soil. This system is especially adapted for use in back-yard gardens where city water is available and the area under cultivation is small. Subirrigation is expensive to install, as the lines of tiles should be about 3 feet apart, or one line for each standard row. By

connecting the tiles at one end by means of tiles across the rows the water may be discharged from a hose into the tiles at one point and will find its way to all parts of the system, entering the soil through the openings.

INSECTS AND DISEASES AFFECTING GARDEN CROPS.

In the control of insects and diseases that infest garden crops it is often possible to accomplish a great deal of good by careful management. In the autumn, after the crops have been harvested, or as fast as any crop is disposed of, any refuse that remains, if diseased or infested with insects, should be gathered and burned. Many garden insects find protection during the winter under boards and any loose material that may remain in the garden. Dead stems or leaves of plants are frequently covered with spores of diseases that affect those crops during the growing season, and these should be burned, as they possess very little fertilizing value.

This subject is treated in Farmers' Bulletin 856, entitled "Control of Diseases and Insect Enemies of the Home Vegetable Garden," to which reference should be made for detailed suggestions for the control of insects and diseases affecting vegetables.

THE STORAGE OF VEGETABLES FROM THE GARDEN.

It is as important to store the surplus vegetables properly as to grow them. The successful storage of vegetables is not at all difficult; in fact, good storage facilities already exist in most homes, it being only necessary to make use of the cellar, the attic, a large closet, or some other part of the dwelling, depending upon the character of the product to be stored. A cool well-ventilated cellar under the dwelling offers good conditions for the storage of such vegetables as potatoes, carrots, beets, and other root crops. If such a cellar is not available, it is often possible to store in banks or pits or in outdoor cellars. For full information on the storage of vegetables, see Farmers' Bulletin 879, entitled "Home Storage of Vegetables."

CULTURAL SUGGESTIONS FOR SPECIFIC CROPS.

ARTICHOKE, GLOBE OR FRENCH.

The French or globe artichoke is grown commercially in California and in some of the Southern States. It is grown for home use to some extent in nearly all sections of the United States except in the very coldest portions. When grown in the North it is necessary to protect the crown in winter, to prevent injury by freezing. The plants are usually propagated from suckers, or offshoots, taken from older plants. Seeds are sometimes used, but the seedlings do

not come true to the variety and the seedling plants often bear heads of inferior quality. When seeds are used for propagating the plant, they should be sown in a well-prepared seed bed, preferably in a hotbed or coldframe. When the young plants reach a height of 5 or 6 inches they should be set in the field or garden. The plants usually do not bear heads until the second year, but in California when the plants are set in April some heads are gathered the first season. The plants will continue to head for several years if they are not allowed to produce too many suckers. As a rule, the planting is renewed every four or five years.

The globe artichoke requires a deep, rich soil for its best development. If grown on poor soil the heads will not be tender and palatable. Barnyard manure is the best fertilizer for this crop, although commercial fertilizers can be used to advantage where the soil contains considerable humus. Many growers apply 20 to 25 tons of manure to the acre each year. Where commercial fertilizer is relied upon, an application of 1,000 to 1,500 pounds of high-grade material can be used to advantage. Clean cultivation should be given throughout the growing season. Hand hoeing between the plants in the row is necessary, especially when the plants are small.

The heads should be cut from the plant when the scales are still tender and form a compact globe. If the heads are allowed to remain on the plant too long, they become tough and woody. The heads are prepared for the table in many ways, the most common of which is to boil in salted water until tender and serve whole. They are eaten by pulling off the scales with the fingers, then dipping the base of the scale in drawn butter and removing the fleshy part by drawing it between the teeth. Artichokes, when the heads are tender, are sometimes served raw as a salad and are used in many other ways.

There is a limited demand for globe artichoke heads in most of our markets, but they must be of good size, tender, and free from spines. The heads are graded according to size and packed for shipment to distant markets in tight drums. For local markets the heads are usually packed in open boxes or baskets.

ARTICHOKE, JERUSALEM.

The Jerusalem artichoke will grow in any good garden soil and should be planted 3 to 4 feet apart each way, with three or four small tubers in a hill. If large tubers are used for planting, they should be cut the same as Irish potatoes. Plant as soon as the ground becomes warm in the spring and cultivate as for corn. A pint of tubers cut to eyes will plant about 30 hills. The tubers will be ready for use in October, but may remain in the ground and be dug at any time during the winter.

The tubers are prepared by boiling until soft and are served with butter or creamed. They are also used for salads and pickles.

The Jerusalem artichoke is not of great importance as a garden vegetable, and the plant has a tendency to become a weed.

ASPARAGUS.

Asparagus should be grown in every home garden where it will thrive, because it is one of the earliest vegetables and is a valuable addition to the spring diet. The soil for asparagus should be made quite rich by the application of partly rotted manure before the plants are set. As soon as danger from hard frosts is over, the seeds of asparagus may be sown in the rows where the plants are to remain. Soaking the seed in hot water for an hour or two before planting will hasten germination. The seedlings should be thinned to stand 15 inches apart in the row.

Quicker results can be secured, however, by buying roots from some seedsman or dealer. The roots may be planted in the autumn or early spring. Before setting the plants, the soil should be loosened deeply by spading or with a subsoil plow. When horse cultivation is to be used, set the plants 15 inches apart in rows $3\frac{1}{2}$ to 4 feet apart. When hand cultivation is to be used, the roots may be set in a solid bed 1 foot apart each way. Cover the roots to the depth of 4 or 5 inches. The bed should receive a dressing of manure or fertilizer each year, preferably in the autumn.

No shoots should be removed the first year the plants are set in the permanent bed, and the cutting season should be short the second year. After the bed is well established, with proper care and fertilizing it should last indefinitely. During the cutting season, all of the shoots, even those too small for use, should be removed. After this, the tops should be allowed to grow until late in the season, when they should be removed and burned and the soil between the rows cultivated. Apply a dressing of manure after cultivation, and allow the manure to remain on the bed.

Varieties recommended: Palmetto, Reading Giant, and Giant Argenteuil.

For further information, read Farmer's Bulletin No. 829, entitled "Asparagus."

BEANS.

Beans will not withstand much cold, so they should not be planted until danger of frost is past and the ground begins to warm up. The first planting should be made as soon as the ground is reasonably warm, and other plantings may be made at intervals of ten days or two weeks until hot weather sets in. Beans for the fall garden should be planted in late summer, and successive plantings may be made

at the intervals suggested until about eight weeks before time for the first frost in the autumn.

Bush beans should be planted to stand 3 or 4 inches apart in rows 30 inches apart where horse cultivation is to be used. For hand cultivation, 20 to 24 inches between the rows will be satisfactory. Among the best varieties of bush beans are the Stringless Green Pod, Refugee, Hodson's Kidney Wax, Currie's Rustproof Wax, and Wardwell's Kidney Wax.

Lima beans, both pole and bush, should be grown in the garden. These should be planted after all danger of frost is over and the soil is warm. Plant the pole beans 8 to 10 seeds in a hill and thin to 3 or 4 after the plants become established. The hills should be 4 or 5 feet apart. For bush Lima beans, plant 5 or 6 inches apart in rows 30 to 36 inches apart.

When planting beans of any kind the seed should not be covered over 2 inches, and on heavy soils they should not be covered more than $1\frac{1}{4}$ to $1\frac{1}{2}$ inches.

Varieties recommended: Seibert's Pole Lima, Carpinteria Lima, and King of the Limas are good varieties of pole Lima beans, and Landreth's Bush Lima, Dreer's Bush Lima, and Henderson's Bush Lima are good varieties of the bush type.

For further information on bean growing, read Farmers' Bulletin 289, entitled "Beans."

BEETS.

Beets can be planted as soon as danger of frost has passed, even before the ground has become warm. Sow the seeds in drills 14 to 18 inches apart, if to be hand cultivated, covering to the depth of about 1 inch. As soon as the plants are well up, thin them to stand 3 to 4 inches apart. Make two or three plantings, so as to have a continuous supply of young, tender beets throughout the season. In many sections of the South beets may be left in the ground through the winter, to be pulled when wanted.

Varieties recommended: Crosby's Egyptian, Bassano, Early Eclipse, and Early Blood Turnip.

BORECOLE. See KALE.

BRUSSELS SPROUTS.

Brussels sprouts are closely related to cabbage and cauliflower, and may be grown in the same manner. Instead of a single head, Brussels sprouts form a large number of small heads in the axils of the leaves (fig. 13).

As the head begins to crowd, the leaves should be broken from the stem of the plant, to give them more room. A few leaves should be

left at the top of the stem where the new heads are being formed. Brussels sprouts are more hardy than cabbage, and in mild climates may remain in the open ground all winter, the heads being removed as desired. For winter use in cold localities, take up plants that are well laden with heads and set them close together in a pit, coldframe, or cellar, with a little soil around the roots. The uses of Brussels sprouts are similar to those of cabbage, but they are considered to be of a superior flavor.

CABBAGE.

In Florida and the Gulf coast region of the other Southern States cabbage seed may be sown in the open any time from September to January. Along the Atlantic coast, from Charleston, S. C., to Florida, seed may be sown in the open in October. In all other sections

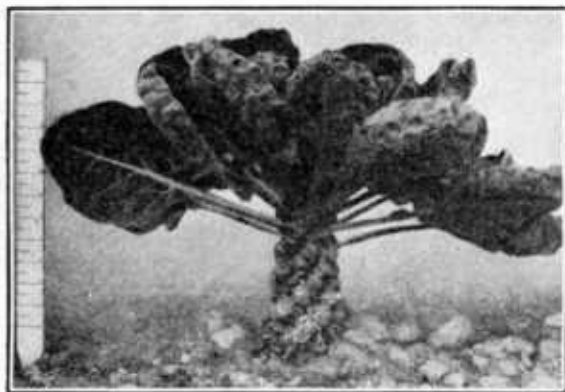


FIG. 13.—A single plant of Brussels sprouts. The small "heads" on the stalks are cut off and cooked like cabbage.

of the South hotbeds or coldframes should be used for starting the plants. A canvas-covered frame will be satisfactory except in the colder regions of the South, where hotbeds should be used. The seed should be planted in the frames in November or December, or about eight weeks before time for planting in the open. Cabbage will withstand a hard freeze if the plants have been hardened off before they are planted in the field.

For spring and early-summer cabbage the following varieties are recommended: Jersey Wakefield, Charleston Wakefield, Allhead Early, and Succession. The Copenhagen Market, a new variety, has given excellent results in many localities and is well worthy of a trial.

In most sections of the South it is not advisable to grow cabbage during midsummer, but a fall crop should be grown. The same varieties may be grown in the autumn as in the spring, but it is usually desirable to plant larger varieties, such as Flat Dutch or Danish Ball Head. Seed for the fall crop should be planted in a cool location in late summer and the plants set out as soon as they reach the proper size and the soil contains sufficient moisture to start growth. Cabbage plants should be set 14 to 18 inches apart in

rows 30 to 36 inches apart. The earlier varieties, which grow small heads, are usually set closer than the later ones.

For further information on cabbage growing, read Farmers' Bulletin 433, entitled "Cabbage."

CABBAGE, CHINESE.

This plant is said by botanists to be very closely related to the turnip. It makes a head of erect leaves, with no stem, the head (fig. 14) resting directly on the ground. It is often listed by seedsmen as *Pai T'sai*, or *Pe-tsai*, which is one form of its Chinese name. The plant may be used as a potherb, like kale or spinach, or, when headed, makes a very fine salad plant, being more tender when cut up for slaw than the ordinary cabbage. It is difficult to get it to head in the spring, especially in the South, so that the spring crop is usable only as greens. For the fall crop it should be planted at the same time as fall turnips, as it matures in much less time than ordinary cabbage.



FIG. 14.—A trimmed head of Chinese cabbage ready for use.

The Chinese cab-

bage demands very rich, well-drained soil, but must not be allowed to suffer from lack of moisture. Seed should be started in a seed bed, and the plants should be transplanted when they are quite small. They should be set not closer than 2 feet apart each way, and will well repay careful and continuous cultivation.

CARROT.

The soil and cultural requirements of carrots are practically the same as for beets. Carrot seed, however, should not be planted so deep as beet seed, and the plants can be allowed to grow closer

together in the row. Carrots may be dug in the autumn and stored in banks or cellars, or they may be left in the ground to be harvested as needed.

Varieties recommended: Half-Long Scarlet, Early Scarlet Horn, and Chantenay.

CAULIFLOWER.

Cauliflower thrives best on a rich, moist soil. The culture of this crop is about the same as for cabbage, but it will not withstand as much frost. In order to secure bleached heads it is necessary to protect them from the sun. The usual practice is to tie the leaves together over the heads.

Cauliflower is often prepared for the table in the same way as cabbage. One of the best methods of preparing cauliflower is to boil the whole head in salt water (1 teaspoonful of salt to 1 quart of water) until it is tender. Drain off the water, place the cauliflower in a baking dish, and pour over it a white sauce made as follows: Melt 2 tablespoonfuls of butter and rub into it 2 tablespoonfuls of flour; add 1 cup of cold milk; stir until smooth; boil the milk with the flour; and butter until thick. Pour the white sauce over the cauliflower, sprinkle with 2 tablespoonfuls each of grated cheese and buttered crumbs, and brown in an oven.

Varieties recommended: Early Snowball and Dwarf Erfurt are the varieties of cauliflower most commonly grown in the South.

CELERY.

In the lower South celery is grown as a fall or winter crop, as it will not mature during hot weather. The seed is sown in a cool, shady place in late summer and the plants set out in the autumn as soon as the soil becomes moist. The seed should be sown in rows and covered lightly (not more than one-eighth of an inch) or sown broadcast and covered with burlap, straw, or some other material, to prevent the loss of moisture while the seed is germinating. It will be necessary to water the seed bed often during dry weather.

In the upper South celery may be grown in the spring or in the autumn. As a spring crop, the seed should be started in a hotbed during the winter, so that the plants may mature before midsummer. Celery does not bleach well in hot weather, but rots when banked or boarded for bleaching.

Set the celery plants 6 inches apart in rows 3 feet apart for horse cultivation or 18 to 24 inches apart when hand cultivation is to be employed.

Celery requires a deep, rich, moist soil and frequent shallow cultivation. When grown as a fall crop celery may be planted after some other crop, such as peas, beans, cabbage, lettuce, or radishes. When

the celery plants are nearly grown a little soil should be drawn around the base to hold the plants in place. About two weeks before they are wanted for the table the bleaching should begin. Soil, boards, or paper may be used for bleaching, but soil should be employed only when the weather is cool. When soil is to be used for bleaching, the rows should be 4 feet apart. Some quick-maturing crop can be grown between the rows of celery to make use of the space up to the time for bleaching.

Varieties recommended: Golden Self-Blanching, Columbia, and Giant Pascal.

For further information on celery growing, read Farmers' Bulletin 282, entitled "Celery."

CHARD.

Chard, or Swiss chard, is a beet which is grown for its foliage instead of its root (fig. 15). The leaves are cooked and used in very much the same way as spinach, as a potherb or green. The thickened leaf stem is sometimes



FIG. 15.—A single plant of chard, showing leaves ready for use.

cooked and used very much like asparagus. One of the good points about this vegetable is that crop after crop of leaves may be cut without injuring the plant.

Chard is planted about the same time and in the same manner as beets, but as the top grows larger it should be given more space than the garden beet.

COLLARDS.

A group of nonheading cabbages differing slightly from kale, but withstanding summer heat better than either kale or cabbage, is extensively grown throughout the South under the name of Georgia collards. Collards do not make a true head, but form a rosette of leaves, which are very tender. The culture and uses of this plant are the same as those of cabbage and kale.

CORN, SWEET.

Sweet corn should be planted on rich land and cultivated the same as field corn. Plant the seed as soon as the soil is warm in the spring, and make successive plantings every two or three weeks until late summer. The same results can be obtained to some extent by planting early, medium, and late varieties. Plant the seeds about 2 inches deep in drills 3 feet apart, and thin to a single stalk every 10 to 14 inches.

Sweet corn, when grown in the South, passes so quickly from the milk to the dough stage that care should be exercised to gather the crop just at the right time, in order to secure the most satisfactory results. The flavor of sweet corn depends upon the stage of maturity and the method of handling the product from the plant to the table. Sweet corn loses its sugar content very rapidly after being removed from the stalk. It should, therefore, be picked only a few hours, and preferably a few minutes, in advance of the time when it is to be placed in the pot.

Varieties recommended: For early corn Golden Bantam and Adams Early are suggested, and for medium and late varieties Black Mexican or White Mexican, Country Gentleman, and Stowell's Evergreen. The last-named variety has the largest ears and is the most productive.

CUCUMBERS.

The soil for cucumbers should be rich, and it is a good plan to apply well-rotted manure under the rows or hills. If planted in rows, open the furrow and scatter the manure along the furrow, turning fresh soil over the manure before planting the seeds. If the seeds are planted in hills, confine the application of manure to the area occupied by the hills.

As cucumbers are easily injured by cold, it is not advisable to plant until all danger of frost is over and the ground has begun to warm up. For very early cucumbers the seeds should be planted in a hotbed in old strawberry boxes or plant bands or directly in the soil of the bed. By starting the plants in hotbeds the cucumbers will be ready for the table two or three weeks earlier than if started in the open. For the main crop, drill the seed in rows 5 feet apart, and after the plants reach a height of 3 or 4 inches thin them to stand 12 to 18 inches apart in the row, or plant the seeds in hills 4 feet apart each way and thin to two or three plants to the hill.

Cucumbers should be given frequent shallow cultivation until the vines fill most of the space between the rows; after this very little attention will be needed except to pull out any weeds by hand. Do not allow any fruit to ripen on the vines until the end of the picking season, as new fruits will not form while older ones are ripening.

Young cucumber plants are often destroyed by the cucumber beetle. It is possible to protect the plants by covering them with small wooden frames over which mosquito netting has been stretched. Air-slaked lime sprinkled over the small plants is an added protection against the cucumber beetle.

Varieties recommended: White Spine, Davis Perfect, and Emerald.

For further information on cucumber growing, read Farmers' Bulletin 254, entitled "Cucumbers."

EGGPLANT.

The plants for this crop should be started in a hotbed or in a box in the house about two months before time for planting in the field.



FIG. 16.—The eggplant, when grown under good cultural conditions, as shown in this illustration, is a prolific yielder. All the fruits shown here are on a single plant.

They should not be set in the field until after all danger of frost has passed and the ground has become quite warm. Set the plants 18 to 24 inches apart in rows 3 feet apart, and give clean, shallow cultivation to keep the plants growing rapidly. A dozen good, healthy plants will supply enough fruit for the average-sized family throughout the season, as they are prolific when well grown (see fig. 16).

Eggplant may be used in several ways, one of which is the following: Peel and cut into slices one-fourth to one-half inch thick and soak in salt water for an hour; boil until tender; then coat with

cracker crumbs or flour and fry in butter or fat. Another method is to steam or bake the eggplant whole, the pulp being eaten from the shell with salt, pepper, and butter.

Varieties recommended: New York Improved Purple, Black Beauty, and Florida High Bush.

GARLIC.

Garlic is propagated by separating the bulbs into the small bulblets, or cloves, and planting these separately in rows 12 to 14 inches apart and from 3 to 4 inches apart in the row, either in the autumn or spring. In other respects the cultivation is the same as for onions. The mature bulbs are pulled and left on the ground until the tops are dry, when they are gathered, braided together, and hung in a shed to cure. Garlic is used for flavoring purposes.

HORSE-RADISH.

Horse-radish can be grown in the cooler portions of the South, but does not thrive in the lower South. It does best in a deep, rich soil where there is plenty of moisture. The rows should be 3 feet apart and the plants 12 to 18 inches apart in the row. Tops cut from large roots or pieces of small roots are used for planting. A comparatively few hills of horse-radish will be sufficient for family use, and the roots required for starting can be secured of seedsmen for 25 or 30 cents a dozen. This crop will require no particular cultivation except to keep down the weeds and is inclined to become a weed itself if not controlled.

The large fleshy roots are prepared for use by peeling and grating. The grated root is treated with a little salt and vinegar and served as a relish with meats, oysters, etc. The roots should be dug during the winter or early spring before the leaves start. After being treated with salt and vinegar the grated root may be bottled for summer use.

KALE.

Kale is a very hardy crop and can be grown in the open during the autumn and winter in practically all sections of the South. Sow the seed early in the autumn, in drills 18 inches apart for hand cultivation and 30 inches apart for horse cultivation. Thin the plants to stand 4 to 6 inches apart in the row. A spring crop of kale should be planted to furnish fresh, tender greens after the winter kale has become tough. Seed for the spring crop may be sown as soon as the soil can be conveniently worked.

Varieties recommended: Dwarf Curled, Tall Scotch, and Siberian.

KOHL-RABI.

Kohl-rabi belongs to the same class as cabbage and cauliflower, but does not resemble either. The edible portion is the swollen stem,

which resembles a turnip, but which is formed above ground, as shown in figure 17. Kohl-rabi should be grown both in the spring and in the autumn. Sow the seed in drills and thin the plants to 6 inches apart in the row. The rows should be 18 inches apart for hand cultivation and 30 to 36 inches apart for horse cultivation. The fleshy stems should be used while fresh and tender, as they become tough and stringy with age.

Variety recommended: White Vienna.

LETTUCE.

Lettuce thrives best during cool weather, so it should be planted in the spring and autumn. In order that the leaves or head may be crisp, the crop should be forced and successive plantings made ten days or two weeks apart. In the lower South lettuce can be grown in the open and in the upper South in hotbeds or coldframes throughout the winter.

When grown in the garden the seeds should be sown in rows 14 to 16 inches

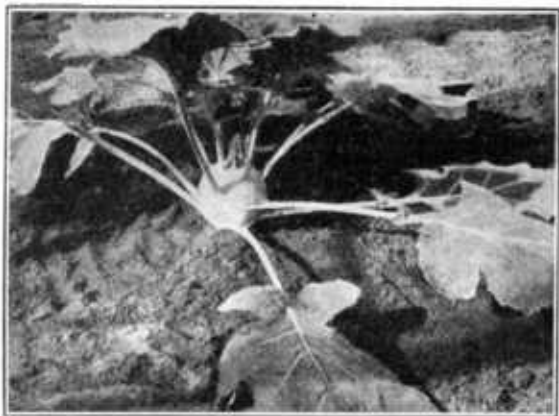


FIG. 17.—Kohl-rabi, showing the swollen stem, which grows above ground.

apart and the plants thinned to the desired distance. The heading type should be thinned to stand 8 inches apart in the row, but with the loose-leaf type the plants may be grown close together and thinned as needed for the table. For a very early crop, start the plants in a hotbed or coldframe and transplant the young plants to the garden as soon as hard freezes are over.

Lettuce planted in the autumn may be left in the ground over winter in many sections of the South. Give the plants frequent shallow cultivation with hand tools.

Varieties recommended: Grand Rapids or Black-Seeded Simpson for loose-leaf lettuce, and Big Boston, Hanson, and California Cream Butter for head lettuce. Figure 18 shows a good type of head lettuce.

MELONS.

Muskmelon.—The culture of the muskmelon is the same as for the cucumber except that the plants are usually given more space. Plant 8 to 10 seeds in a hill, spacing the hills 6 feet apart each

way. After the plants become established, thin out all but four of the best ones. Another method is to sow in drills 6 feet apart and thin to single plants 18 to 24 inches apart.

Varieties recommended: Rocky Ford, Netted Gem, Emerald Gem, Eden Gem, Jenny Lind, and Paul Rose.

Watermelon.—The cultivation of the watermelon is the same as for the cucumber and muskmelon, except that the plants require more space. Plant watermelon seed in rows 8 to 10 feet apart and

thin to single plants 3 feet apart, or plant in hills 8 to 10 feet apart each way.

Varieties recommended: Kleckley Sweets, Florida Favorite, Georgia Rattlesnake, and Tom Watson.



FIG. 18.—Head lettuce, which produces very tender, almost white leaves in the center of the head, but is harder to grow than the loose-leaf types.

Mustard is used largely for greens and can be grown in early spring and late autumn. The seeds for the spring crop should be sown as soon as the soil can be put into condition. For the fall crop, sow the seeds in late summer or early autumn in drills about 1 foot apart. As the plants require but a short time in which to reach edible maturity, frequent sowings should be made.

Varieties recommended: Giant Ostrich Plume and Large-Leaved Curled.

OKRA, OR GUMBO.

Sow seeds of okra in the open after danger of frost is over and the soil becomes quite warm. The rows should be 3 to 4 feet apart for dwarf varieties and 4 to 5 feet for the tall kinds. Sow the seed a few inches apart in the row and thin the plants to 18 inches to 2 feet apart. Give frequent shallow cultivation until the plants are nearly grown.

The pods are the part of the plant used for food and should be gathered while still crisp and tender. If the pods are removed so as to allow none to ripen, the plants will continue to bear until killed by frost.

Varieties recommended: White Velvet, Dwarf Green Prolific, Perkins Mammoth, Long Podded, and Lady Finger.

For further information on okra, read Farmers' Bulletin 232, entitled "Okra: Its Culture and Uses."

MUSTARD.

ONIONS.

For very early bunch onions it is the common practice to plant sets in drills 12 to 14 inches apart and 2 to 3 inches apart in the row. The sets may be put out in the autumn or as early in the spring as the land can be prepared. In the cooler regions of the South the sets will need some protection if planted in the fall, and hay or straw may be used to keep them from freezing.

For dry onions, sow the seed thickly in drills about 12 to 14 inches apart in the spring as soon as danger from hard frosts is over. For early bulbs the seed may be planted in a hotbed or coldframe and the young plants transplanted to the open when conditions are favorable. Plants 4 or 5 inches high are of good size for transplanting.

Onions require frequent shallow cultivation, and it may be necessary to resort to hand weeding. When the tops begin to die and the bulbs are full grown, the onions should be pulled and left in the field for a few days to dry. Then the tops should be clipped off and the bulbs placed in crates or bags and stored in a well-ventilated place to cure.

Early green onions may also be produced from the Multiplier or Potato varieties planted in the autumn. The large bulbs of these onions contain a number of "hearts," or buds, and if planted will produce a number of marketable onions and a bunch of "sets." The small sets have but one "heart" and will produce large bulbs the next year. A few large bulbs should be planted each year to produce sets for fall planting.

The Top, or Tree, onion produces a number of bulblets on top of the stem. These small bulbs can be planted in the autumn and will produce onions the following spring.

Varieties recommended: Southport White Globe, Southport Red Globe, Southport Yellow Globe, Danvers, Red Wethersfield, Australian Brown, and Prize Taker. In some sections of the South the Creole is grown and the Louisiana, or Red Creole, is a popular variety. The Bermuda is a good type of mild-flavored onion and is desired by many. The important varieties of Bermuda onions are the Crystal Wax, White Bermuda, and Red Bermuda.

For additional information on onion growing, read Farmers' Bulletin 354, entitled "Onion Culture."

OYSTER PLANT. See SALSIFY.

PARSLEY.

Parsley is used mainly for garnishing meats, but can be used for flavoring soups and other foods. Sow parsley seed thickly in a drill, or sow broadcast and cover lightly either in the autumn or early spring. A space a yard square will be sufficient for parsley.

Varieties recommended: Plain Leaved and Double Curled.

PARSNIP.

Sow parsnip seed in the spring as soon as danger of hard frost is over, in drills 14 to 16 inches apart. Thin the plants to stand 3 inches apart in the rows. The cultivation of parsnips should be about the same as for beets and carrots. A crop may be planted in late summer for winter use, and the roots may be left in the ground through the winter or until needed, as freezing is believed to improve the flavor of parsnips. If it is desired to plow the garden before the parsnips are disposed of, they may be dug and stored in a cool place or buried in banks or pits.

Varieties recommended: Hollow Crown and Sugar.

PEAS.

Garden peas, sometimes called English peas, are not injured by light frosts, so they should be planted as soon as the soil can be put in order in the spring. The first plantings should be of small-growing, quick-maturing varieties, such as Alaska, First and Best, and Gradus, which do not require supports. These varieties should be followed by the large, wrinkled type of peas, such as Champion of England, Telephone, and Prize Taker. The large-growing varieties should be supported on brush, as shown in figure 19, on strings attached to stakes driven in the ground, or on wire netting. In order to have a continuous supply of peas, plantings should be made every 10 days or two weeks until warm weather. Peas should be planted in late summer and autumn for the fall garden, for which the early varieties are more desirable than the late ones.

Peas should be planted about 2 to 3 inches deep in rows 3 to 4 feet apart. Some gardeners, however, follow the practice of planting in double rows 6 inches apart with the ordinary space of 3 to 4 feet between these pairs of rows. This is a good practice with varieties requiring support, as the supports can be placed in the narrow space between the rows.

Varieties recommended: Alaska, First and Best, Gradus, Telephone, Champion of England, and Prize Taker.

PEPPERS.

Seeds of peppers should be sown in a hotbed or in a box in the house about eight weeks before the time for setting the plants in the garden. The plants are tender and should not be transplanted until the ground is warm and all danger of frost is past. Set the plants 15 to 18 inches apart in rows $2\frac{1}{2}$ to 3 feet apart. The cultivation and treatment of peppers should be the same as that of tomatoes and eggplants. There is a large number of varieties of peppers, including the sweet kinds and the hot peppers.

Varieties recommended: Ruby King, Chinese Giant, Sweet Spanish, and Bell or Bull Nose, of the sweet peppers; Long Red Cayenne, Tabasco, and Red Cluster, of the hot types.

POTATOES.

Irish or white potatoes.—A small area of early potatoes should be grown in the garden, but the main crop should be grown elsewhere. Early potatoes should be planted as soon as the ground can be prepared to good advantage. In Florida, potatoes are usually planted in December, while in other sections of the lower South they

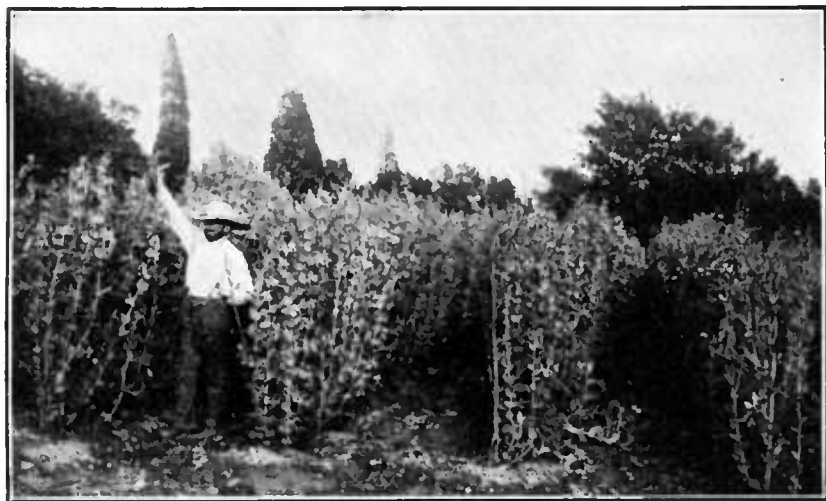


FIG. 19.—Tall-growing peas of the Telephone type supported on brush.

are planted in January. In the upper South early potatoes are usually planted in February, but in the extreme northern portion of the South they are not planted until March. As it is difficult to keep potatoes through the summer, a fall crop should be grown. A common practice in some parts of the South is to plant potatoes from the first crop as soon as they are dug. In the lower South this method can be followed to advantage. Another method is to bed the potatoes on a little loose soil in a cool, shady place, covering the bed with litter or soil and moistening it thoroughly. As soon as the tubers sprout they are planted in the field for the late crop.

Potatoes are planted 12 to 14 inches apart in rows $2\frac{1}{2}$ to 3 feet apart and covered to a depth of about 4 inches. Potatoes planted during hot weather should be covered 6 inches deep unless they have been sprouted before planting. The furrows are usually opened with a 1-horse turnplow, or lister, and the potatoes dropped, one piece in a place, in the bottom of the furrow. As it requires two or three weeks for potatoes to come up, it is important that they be cultivated as soon as the row can be followed. If a crust forms be-

fore the potatoes come up, a spike-tooth harrow or weeder should be run over the ground to loosen the surface of the soil. Harrow-toothed cultivators should be used for the main cultivation, but at the last cultivation the soil may be worked up around the plants to hold them erect and to protect the tubers from the sun.

After digging the early potatoes they should be kept in a cool, dry place during the hot weather of summer. In the lower South it is better to grow a fall crop rather than to try to keep the spring crop through the summer and winter. Fall-grown potatoes can be kept in a dry cellar, in a pit, or in any building where the temperature can be controlled. Irish potatoes keep best in a cool temperature, but should not be allowed to reach the freezing point. It is best not to allow the temperature to fall below 36° F.

Varieties recommended: Irish Cobbler, Triumph (Red Bliss or Bliss Triumph), and White Triumph are good early potatoes. Where only one variety is to be grown, the Irish Cobbler is recommended. The same varieties may be grown for the fall crop, or the Green Mountain and McCormick (also known as Lookout Mountain and Peachblow) may be planted. The McCormick is more likely to produce a good yield in the South than the Green Mountain, but is of rather poor quality.

For more complete information, read Farmers' Bulletin 407, entitled "The Potato as a Truck Crop."

Sweet potatoes.—The sweet potato is not usually handled as a garden crop in the South, but it is advisable to have a few plants in the garden for early summer use. On land that is not thoroughly drained, sweet-potato plants should be set on ridges which are thrown up by means of a plow. Two or four furrows are usually thrown together and leveled off with a light drag. The ridges should be broad, as narrow sharp ridges dry out quickly. The fertilizers recommended for general garden treatment will be found satisfactory for sweet potatoes. The roots that are too small for marketing are usually used for seed. For an early crop the roots should be bedded in a hotbed five or six weeks before it will be safe to set the plants in the field. As the plants are easily injured by cold, they should not be transplanted until danger of frost has passed. For the general crop in the lower South, select a protected location, preferably on the south side of a building or fence, and bed the roots in the open. A common method is to make an excavation 6 inches deep and of sufficient size to accommodate the roots to be bedded. Place in this a layer of sand or loose soil on which to bed the sweet potatoes. Put the roots close together, but do not allow them to touch, and cover them with sand or loose soil 1 to 2 inches deep. Soil on which sweet potatoes have been grown should not be used for the seed bed. Ten bushels of sweet potatoes will furnish enough slips to plant an acre. From these slips, if set out early, may be taken enough vine cuttings to plant 7 or 8

acres. Vine cuttings may be planted as late as July in the upper South and as late as August in the lower South. They will produce as large crops as slips, with less danger from the diseases which affect the roots.

Sweet potatoes should be dug on a bright day when the soil is dry. The time for digging varies in different sections, but the potatoes should be dug before there is any danger of hard frosts. When grown on a small scale, sweet potatoes may be dug with a spading fork. Great care should be taken not to bruise or injure the roots in handling. After digging, the roots should lie exposed for two or three hours to dry, after which they should be placed in a warm, well-ventilated room. The temperature during the curing period of about 10 days should be about 80° to 90° F. After the curing period the temperature should be lowered gradually to about 55° F. and held at that point during the remainder of the storage period. A small crop may be cured near the kitchen stove and afterwards stored in a dry room where there is no danger of their becoming chilled. Handle sweet potatoes as little as possible.

Varieties recommended: Pumpkin Yam, Dooley, Nancy Hall, Triumph, and Southern Queen. Where a dry-fleshed potato is desired, Improved Jersey, Big-Stem Jersey, and Triumph are recommended.

For further information on sweet-potato culture, read Farmers' Bulletins 324 and 548, entitled "Sweet Potatoes" and "Storing and Marketing Sweet Potatoes," respectively.

RADISH.

The radish is quite hardy and may be grown in the open all winter in the lower South and in coldframes in the upper South. Sow the seed in the open ground as soon as danger of hard frosts is over, or in coldframes whenever space is available. In the open, sow the seed in drills 12 to 15 inches apart and thin the plants to 1 inch apart. Successive plantings should be made every 10 days or two weeks until hot weather comes, and again in the autumn when the weather begins to get cool.

Varieties recommended: There are three types of radishes—turnip shaped, olive shaped, and long. Of the turnip shaped, the best varieties are the Scarlet Globe and Scarlet Turnip. The best of the olive-shaped sorts are the French Breakfast and Early Scarlet. The Long Scarlet Chartist, Long White Spanish, and Icicle are the best varieties of the long type.

RHUBARB.

Rhubarb can be grown in the upper South, but can not be grown satisfactorily in the lower South. For home use it is best to buy roots from a dealer rather than to grow plants from seed. Ten to twelve good hills are sufficient for the average family.

Set the roots 3 to 4 feet apart along the garden fence and manure heavily. The treatment suggested for asparagus is satisfactory for rhubarb. Do not allow the plants to go to seed.

SALSIFY, OR VEGETABLE OYSTER.

Sow seeds of salsify at the same time and in the same manner as those of parsnips and carrots. An ounce of seed will plant a 100-foot row and should be sufficient for an average family. After the plants are up, thin them to about 2 inches apart in the row. Salsify may be dug and stored the same as parsnips and carrots or left in the soil until needed. It is a biennial, and if the roots are not dug they will produce seed the second season.

Salsify deserves more general cultivation, as it is one of the most desirable root crops. It may be used in about the same way as parsnips. It is sometimes boiled, rolled in cracker crumbs, and fried in butter. Salsify when fried or used for making soup has a decided oyster flavor, from which it gets the name of vegetable oyster.

The Sandwich Island is the variety commonly grown.

SPINACH.

Spinach is one of the best crops grown for greens and should be found in every home garden. It can be grown in the open throughout the autumn and winter in all sections along the coast from Norfolk, Va., south and in the lower tier of Southern States. In the colder regions of the South it may need a little protection during the coldest weather. Two or three inches of hay, straw, or leaves will be a satisfactory protection, or the winter crop of spinach in the colder regions of the South may be grown in canvas-covered frames. The seed planted in the autumn will furnish greens through the winter and early spring.

Sow the seeds of spinach in drills 12 to 15 inches apart at the rate of 1 ounce to 100 feet of row. Three or four ounces of seed will produce enough greens for the average family. In gathering, the entire plant is removed. The large plants are selected first, and the smaller or later ones are thus given room to develop.

The Savoy is the variety most commonly grown.

SQUASH.

There are two types of squashes, the bush varieties and the running varieties. The bush varieties should be planted in hills 4 feet apart each way and the running varieties 8 to 10 feet apart each way. Squashes are prolific, and a supply for the average family will ordinarily be furnished by five or six hills of each sort. Squash seed should not be planted until after danger of frost is over and the soil is quite warm. The cultivation and care of squashes should be the same as that given cucumbers or muskmelons.

The summer squash is prepared for the table in several ways. It may be boiled and eaten with butter, pepper, and salt, or it may be parboiled and then fried. It may also be sliced without boiling, soaked in water with a little salt, and then fried in egg and bread crumbs or cracker crumbs, like eggplant. Winter varieties are stewed or steamed, to be served with butter and salt, or are prepared in the same way for pie filling. They may also be baked and served in the shell, or the flesh may be scraped out after baking and served with butter and salt.

Varieties recommended: The varieties of summer squash commonly grown in the South are Pattypan, Summer Crookneck, and Vegetable Marrow. Of the winter squashes, the Delicious and Hubbard are among the best.

TOMATOES.

To get a crop of early tomatoes the seed should be started about eight weeks before the time for setting the plants in the field. In the lower South the plants can be grown in coldframes covered with canvas or cotton cloth, but in the upper South a hotbed should be employed. When only a few plants are needed the seed may be sown in a shallow box in the house. For the best results in growing tomatoes the young plants should be transplanted as soon as they reach a height of $1\frac{1}{2}$ to 2 inches. Transplant these plants to stand 2 inches apart each way in a hotbed, coldframe, or box in the house. When the plants begin to crowd, it is a good plan to transplant them to flower pots, plant bands, old strawberry boxes, or tin cans from which the bottoms and tops have been melted.



FIG. 20.—Tomato plants supported by strings attached to stakes driven in the ground.

Tomato plants should be set in the open as soon as danger of frost has passed. If the plants are to be pruned to one or two stems and tied to stakes, they should be set 18 inches apart in rows 3 feet apart. If the plants are not pruned or staked, they may be planted 3 feet apart in rows 4 feet apart. It is advisable, however, to prune and train to stakes, especially for the early crop, as plants so treated will be healthier and more easily cultivated and will produce fruit which is earlier and more uniform in size and shape than that produced by plants which have not been trained and pruned. Soon after setting the plants in the field, a stake should be driven near each plant, to which it may be tied. Care should be exercised to tie the plant so that it will not be injured by the string. A good plan is to loop the string around the stake and tie it under a leaf stem. Go over the patch once every week or ten days and remove all shoots starting in the axils of the leaves. Figure 20 shows a patch of tomatoes trained to strings attached to stakes driven in the ground.

Varieties recommended: For early tomatoes, Earliana or Chalk's Early Jewel is recommended, preferably the former. For medium and late varieties, the following are suggested: Greater Baltimore, Red Rock, Globe, Beauty, Acme, and Stone. The Stone is usually preferred for canning.

For further information on tomato culture, see Farmers' Bulletin 642, entitled "Tomato Growing in the South."

TURNIPS.

The turnip should be grown both as a spring and as a fall crop. For the spring crop, plant as early as the condition of the soil will permit, and for the fall crop sow the seed in late summer or early autumn. Sow the seed thickly in rows 15 to 18 inches apart, and as the plants reach a height of 4 or 5 inches begin thinning, using the young plants for greens. For good roots thin the plants to about 3 inches apart in the row. Cultivate turnips the same as carrots and parsnips. Turnips may be left in the ground until needed for the table, pulled and stored in a cellar, or buried in banks or pits.

Varieties recommended: Purple Top Globe, White Globe, Seven Top, White Milan, and Yellow Aberdeen.

Large quantities of rutabagas are shipped from the Northern States and Canada into the Southern States each year. While this crop is not commonly cultivated in the South, it may be grown as a fall and winter crop to very good advantage.

Rutabagas are planted the same as turnips, except that they require more room and a longer period of growth.

The Purple Top is the most common variety of rutabaga.